Shri G.S Institute of Technology and Science
Department of Applied Mathematics and Computational Science
B.Tech. I Year MA 10011: MATHEMATICS - I
Total No. of Units: 5 **Total No. of Lectures: 40**

LECTURE PLAN

S.No.	Topic	No. of Lectures
	UNIT-I	
1.	Partial derivatives: Definition, Euler's theorem of homogeneous function.	02
2.	Differentiation of implicit function, Total differential coefficients.	02
3.	Jacobians, Expansion of functions by Taylor's and Maclaurin's series of one variable.	02
4.	Expansion of functions by Taylor's and Maclaurin's series of two variables.	02
	UNIT-II	
5.	Maxima and Minima of functions of two variables.	02
6.	Lagrange's method of undetermined multipliers and their applications.	02
7.	Asymptotes (Cartesian coordinates).	01
8.	Curvature in Cartesian and polar coordinates.	03
	UNIT-III	
9.	Beta and Gamma functions and related examples.	03
10.	Elementary ideas of multiple integrals and Change of order of integration with examples	03
11.	Change of variables in double integrals using Jacobians with examples.	02
	UNIT-IV	
12.	Detailed study of tracing of curves with examples.	03
13.	Area and Length of curve with examples.	02
14.	Volume and Surface of revolution with examples.	03
	UNIT-V	
15.	Review of measures of Central Tendencies and measure of Dispersion	02
16.	Correlation : Karl Pearson and Spearman's rank correlation	02
17.	Curve fitting by the method of least squares, Fitting of straight line, Fitting of Second degree parabolas and more general curves.	04

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Department of Applied Mathematics and Computational Science
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LECTURE PLAN

S.No.	Topic	No. of Lectures
	UNIT-I	
1.	Review of matrices , Rank of a matrix by Echelon form and Normal form	02
2.	Inverse of matrices by Gauss- Jordan method	01
3.	System of linear equations : Solving system of Homogeneous and Non-Homogeneous linear equations	02
4.	Linear Dependence and Independence	01
5.	Eigen values, Eigen vectors with their properties and applications.	02
	UNIT-II	
6.	Cayley-Hamilton theorem. Finding inverse and power of a matrix by Cayley Hamilton Theorem	02
7.	Diagonalization of a matrix	01
8.	Quadratic forms and Nature of the Quadratic forms	02
9.	Reduction of Quadratic form to canonical forms by Orthogonal Transformation	02
10.	Some applications of matrix theory in Engineering domain.	01
	UNIT-III	
11.	Formation of differential equations.	02
12.	Differential equations of first order and first degree (Variable separable and Homogeneous).	02
13.	Differential equations of first order and first degree (Linear and Exact).	02
14.	Linear differential equations with constant coefficients.	02
	UNIT-IV	
15.	Linear differential equations with variable coefficients.	03
16.	Simultaneous differential equations.	01
17.	Method of variation of parameters.	02
18.	Application to simple problems.	02
	UNIT-V	
19.	Mathematical and classical definition of probability, Addition theorem of probability,	02
20.	Multiplication theorem of probability , Review of Basic probability concepts	02
21.	Conditional Probability , Bayes theorem	01
22.	Probability Distribution: Binomial, Poisson and Normal distributions and their application in Engineering field	03